WASHINGTON DEPARTMENT OF ECOLOGY

ENVIRONMENTAL ASSESSMENT PROGRAM

FRESHWATER MONITORING UNIT

STREAM DISCHARGE TECHNICAL NOTES

STATION ID: 03J100

STATION NAME: Hansen Creek near Sedro Woolley

WATER YEAR: 2010

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Introduction

Watershed Description

The Hansen Creek drainage extends from the southwest side of Lyman Hill, south to the Skagit River just east of Sedro-Woolley. The gage basin has a mean elevation of about 1240 feet and ranges from about 80 feet above sea level to about 4030 feet at the top of Lyman Hill. Nearly 70 percent of the basin was found to be forested in a 2001 study. The U.S. Geological Survey estimates annual precipitation at about 50 inches.

Gage Location

The gage is located near river mile 4.0 on Hansen Creek, on Skagit County property at the Northern State Recreation Area. The Primary Gage Index is a staff gage mounted near the right bank of the creek at the base of a large tree about 15 feet downstream from the Thompson Drive Bridge. The gage house is located on the left bank, at roughly the same elevation as the roadway.

Table 1.

Drainage Area (square miles)	7
Latitude (degrees, minutes, seconds)	48, 31, 50 N.
Longitude (degrees, minutes, seconds)	122, 12, 02 W.

Discharge

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	20 cfs
Median Annual Discharge (cfs)	16 cfs
Maximum Daily Mean Discharge (cfs)	78 cfs
Minimum Daily Mean Discharge (cfs)	1.5 cfs
Maximum Instantaneous Discharge (cfs)	101 cfs
Minimum Instantaneous Discharge (cfs)	0.5 cfs
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	43 cfs
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	2.9 cfs
Number of Days Discharge is Greater Than Range of Ratings	31
Number of Days Discharge is Less Than Range of Ratings	39

Note: Statistics displayed in Table 2 may not include values in which the predicted discharge exceeds the range of ratings.

Narrative

Error Analysis

Table 3. Error Analysis Summary.

Logger Drift Error (% of discharge)	16%
Weighted Rating Error (% of discharge)	9%
Total Potential Error (% of discharge)	25%

Rating Table(s)

Table 4. Rating Table Summary

Rating Table No.	8	9	11
Period of Ratings	10/1/09 to 12/06/09	10/15/09 to 2/1/2010	1/1/2010 to 6/9/10
Range of Ratings (cfs)	0.001 to 132 cfs	1 to 105 cfs	8 to 105 cfs
No. of Defining Measurements	6	5	4
Rating Error (%)	11%	9%	7%

Rating Table No.	901	12	
Period of Ratings	4/20/10 to 9/30/10	8/31/10 to 9/30/10	
Range of Ratings (cfs)	1 to 105 cfs	3 to 134 cfs	
No. of Defining Measurements	5	2	
Rating Error (%)	9%	8%	

Rating Table No.			
Period of Ratings			
Range of Ratings (cfs)			
No. of Defining Measurements			
Rating Error (%)			

Narrative

Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	4.29 ft
Maximum Recorded Stage (feet)	9.29 ft
Range of Recorded Stage (feet)	5.00 ft
Number of Un-Reported Days	31 days
Number of Days Qualified as Estimates	258 days
Number of Days Qualified as Unreliable Estimates	0

Narrative

The 31 un-reported days had water levels above the range of ratings.

For much of the year major channel fill buried the bubbler gage terminal end resulting in a very "noisy" gage-height data record. A mathematical Moving n-Point Mean Filter was applied to much of the record to smooth the noisy data. A total of 116 days are qualified as estimated data due only to this data smoothing. More than 100 days are qualified as estimated data due drift in the gaging/logging system. Another 39 days are qualified as estimates due to water levels below the range of ratings.

Modeled Discharge

Table 6. Model Summary

Model Type (Slope conveyance, other, none)	None
Range of Modeled Stage (feet)	N/A
Range of Modeled Discharge (cfs)	N/A
Valid Period for Model	N/A
Model Confidence	N/A

Surveys

Table 7. Survey Type and Date (station, cross section, longitudinal)

Type	Date
Stn, X-Section, and Long.	9/15/2010

Activities Completed

Station, cross- section, and longitudinal surveys were completed. Survey was done during low-flow section control conditions. Results were not suitable for use in developing a slope-conveyance model.